



ENGR 2255

Division: Natural Science and Mathematics

Department: Engineering and Computer Science

Course: ENGR 2255

Title: Analog Circuits Laboratory

Catalog Description:

ENGR 2255 is a laboratory course to accompany ENGR 2250. This course treats instruction in the use of electronic measuring instruments, including multimeters, function generators, power supplies, and oscilloscopes. Electronic components and instruments will be used to apply and illustrate concepts studied in the lecture course.

General Education Requirements: N/A

Semesters Offered: Fall

Credit/Time Requirement: Credit: 1; Lecture: 0; Lab: 3

Clock/Hour Requirements: 0

Offered for Non-Credit: No

Corequisites: Analog Circuits (ENGR 2250)

Justification:

This course is the laboratory component of ENGR 2250 and provides the opportunity for hands on application of the concepts studied in ENGR 2250. Similar courses are offered in university engineering schools. This course is to be taken during the sophomore year of the preengineering curriculum and will prepare the student for subsequent course work.

Student Learning Outcomes:

Upon successful completion of this course, students will be able to:

- use laboratory equipment to verify experimentally the abstract concepts studied in ENGR 2250
- understand the proper use of electronic instruments including multimeters, function generators, power supplies, oscilloscopes, frequency counters, etc.
- design and assemble circuit components to achieve a given result
- keep a laboratory notebook and to write reports that conform to engineering standards.

Content:

This course will include:

- current, voltage, and resistance measurements
- plotting the load line for a power source
- investigation of errors that are inherent in the use of ammeters and voltmeters
- measuring the characteristics of a given device such as a light globe, a resistor, or a light emitting diode

- operational amplifier characteristics and applications
- measuring the time constant of an RC or an RL circuit
- design of a half wave rectifier with a TC filter
- design of various circuits containing a bipolar junction transistor
- measuring current, voltage, and phase angle in an A.C. circuit
- observing the performance of a magnetically coupled circuit.

General Education Outcomes:

6) Apply computational skills to a variety of contexts.

Mathematical and computational skills are essential to the success of an engineering student. The student must be able to perform calculations both manually and through the use of computational software.

7) Apply scientific reasoning to a variety of contexts.

Engineering consists of the application of scientific knowledge in order to design devices and systems with a practical purpose. Thus, students must be able to utilize the discoveries of science in the solution of engineering problems.

Key Performance Indicators:

- Each student will be required to submit a written report on each lab exercise. This report will be evaluated and graded by the instructor. Laboratory reports will comprise 100% of the final grade.

Representative Text and/or Supplies:

- A handout describing each lab exercise will be provided by the instructor.

Optimum Class Size: 16

Maximum Class Size: 24

Signatures:

I hereby submit this course syllabus:

Garth O. Sorenson, MS, Associate Professor

I hereby find this course consistent with the goals and resources of the Engineering and Computer Science Department:

Garth O. Sorenson, MS, Associate Professor, Chair

I hereby find this course consistent with the goals and resources of the Natural Science and Mathematics Division:

Dan Black, EdD, Associate Professor, Dean

I have discussed the need for library resources related to this class with the person submitting the syllabus:

Lynn Anderson, MLIS, Technical Services Librarian (Main Campus)

Michelle Olsen, MLS, Campus Librarian (Richfield Campus)